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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.
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09/274,014 03/22/99 VOUTE

N 9676-286

PENNIE & EDMONDS  
1667 K STREET N W  
WASHINGTON DC 20006

IM52/0517

EXAMINER

SORKIN, D.

ART UNIT

PAPER NUMBER

1723

DATE MAILED:

05/17/01

Please find below and/or attached an Office communication concerning this application or proceeding.

Commissioner of Patents and Trademarks

**Office Action Summary**

Application No.

09/274,014

Applicant(s)

VOUTE ET AL.

Examiner

David L. Sorkin

Art Unit

1723

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 April 2001.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-66 is/are pending in the application.
- 4a) Of the above claim(s) 23-58 and 64-66 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-22 and 59-63 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner.
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved.
- 12) ☐ The oath or declaration is objected to by the Examiner.

**Priority under 35 U.S.C. § 119**

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).

**Attachment(s)**

- 15) ☐ Notice of References Cited (PTO-892)
- 16) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 17) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_
- 18) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 19) ☐ Notice of Informal Patent Application (PTO-152)
- 20) ☐ Other: \_\_\_\_\_

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claims 1-22 and 59-63 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. These claims are rendered indefinite by the phrase "rooted in pores". It is unclear what scope of structures this phrase includes. Particularly, it is unclear to what extent the network must enter into the mineral oxide matrix.

### ***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1-10, 13-22, and 59-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. (US 5,015,373).
5. Claim 1: Carr et al. ('373) discloses dense mineral oxide solid supports comprising a mineral oxide matrix and an interactive polymer network which is on the surface of the mineral oxide matrix (see abstract). It is unclear what "rooted in the pores" means as discussed above. However, it is considered that the network of Carr et al. ('373) would intrinsically enter intricacies to at least some extent. The lowest

porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity <30%. Carr et al. ('373) discloses that "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity below 30%.

6. Claim 2: The supports of Carr et al. ('373) are discussed above with respect to claim 1. Carr et al. fails to explicitly disclose a density of 1.7-11, however because the supports of Carr et al. are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

7. Claim 3: The supports of Carr et al. ('373) are discussed above with respect to claim 2. Carr et al. ('373) fails to explicitly disclose a density of 2.1-10, however because the supports of Carr et al. ('373) are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

8. Claim 4: The supports of Carr et al. ('373), discussed above with respect to claim 1, are in the 5-500 micron range (col. 4, lines 40-45).

9. Claim 5: The supports of Carr et al. ('373), discussed above with respect to claim 4, are in the 10-100 micron range (col. 4, lines 40-45).

10. Claim 7: The supports of Carr et al. ('373) are discussed above with respect to claim 1. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 25%. Carr et al. ('373) discloses that "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 25%.

11. Claim 8: The supports of Carr et al. ('373) are discussed above with respect to claim 7. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 15%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 15%.

12. Claim 9: The supports of Carr et al. ('373), discussed above with respect to claim 1, comprise zirconia (see col. 13).

13. Claim 10: In the supports of Carr et al. ('373), discussed above with respect to claim 1, the polymer network comprises a soluble organic polymer crosslinked in place with the mineral oxide matrix (see col. 27, lines 1-50).

14. Claim 13: In the supports of Carr et al. ('373), discussed above with respect to claim 10, the polymer is disclosed to be polyvinyl alcohol (col. 8, lines 60-68).

15. Claim 14: In the supports of Carr et al. ('373), discussed above with respect to claim 1, the polymer network comprises monomers copolymerized in place with the mineral oxide matrix (col. 8, lines 59-68).

16. Claims 15-22: The monomers of Carr et al. ('373), discussed above with respect to claim 14 include vinylpyrrolidone (col. 65). (Note: the monomer being vinylpyrrolidone is within the claim boundary of each of claims 15-22).

17. Claim 59: The supports of Carr et al. ('373), discussed above with respect to claim 2, are in the 5-500 micron range (col. 4, lines 40-45).

18. Claim 6: Carr et al. ('373) discloses dense mineral oxide solid supports comprising a mineral oxide matrix and an interactive polymer network which is rooted in pores and on the surface of the mineral oxide matrix (see abstract). ). It is unclear what "rooted in the pores" means as discussed above. However, it is considered that the network of Carr et al. ('373) would intrinsically enter intricacies to at least some extent. The supports are in the 10-100 micron range (col. 4, lines 40-45). The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity <30%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity below 30%.

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Carr et. al. ('373) fails to explicitly disclose a density of 2.1-11, however because the supports of Carr et al. ('373) are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

19. Claim 60: The supports of Carr et al. ('373) are discussed above with respect to claim 6. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 25%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 25%.

20. Claim 61: The supports of Carr et al. ('373), discussed above with respect to claim 6, comprise zirconia (see col. 13).

21. Claim 62: In the supports of Carr et al. ('373), discussed above with respect to claim 6, the polymer network comprises a soluble organic polymer crosslinked in place with the mineral oxide matrix (see col. 27, lines 1-50).

22. Claim 63: In the supports of Carr et al. ('373), discussed above with respect to claim 6, the polymer network comprises monomers copolymerized in place with the mineral oxide matrix (col. 8, lines 59-68).

23. Claims 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. ('373) in view of Girot et al. (US 5,445,732).

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24. Claims 11-12: The supports of Carr et al. ('373) are discussed above with respect to claim 10. The soluble organic polymer fails to be a polysaccharide. Girot et al. ('732) teaches polysaccharides including cellulose derivatives (col. 17, lines 2-3). It is considered that it would have been obvious to one of ordinary skill in the art to have utilized a polysaccharide, and specifically a cellulose derivative, as the polymer of Carr et al. ('373), because Girot et al. ('732) also uses the polymers to coat inorganic matrices (col. 5), and Carr et al. ('373) discloses the use of many alternative polymers (col. 8, lines 59-68).

25. Claims 1-22 and 59-63 are rejected under 35 U.S.C. 103(a) as being unpatentable over Carr et al. (US 5,015,373) in view of Girot et al. (US 5,445,732).

26. Claim 1: Carr et al. ('373) discloses dense mineral oxide solid supports comprising a mineral oxide matrix and an interactive polymer network which is on the surface of the mineral oxide matrix (see abstract). The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity <30%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity below 30%. It is unclear what "rooted in pores" means as discussed above. Girot et al. ('732) teaches a polymer network rooted in pores (see fig. 5; col. 12, lines 62-68) to avoid unwanted interactions as taught by Girot et al. ('732) (col. 12, lines 2-4).



27. Claim 2: The supports of Carr et al. ('373) are discussed above with respect to claim 1. Carr et al. fails to explicitly disclose a density of 1.7-11, however because the supports of Carr et al. are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

28. Claim 3: The supports of Carr et al. ('373) are discussed above with respect to claim 2. Carr et al. ('373) fails to explicitly disclose a density of 2.1-10, however because the supports of Carr et al. ('373) are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

29. Claim 4: The supports of Carr et al. ('373), discussed above with respect to claim 1, are in the 5-500 micron range (col. 4, lines 40-45).

30. Claim 5: The supports of Carr et al. ('373), discussed above with respect to claim 4, are in the 10-100 micron range (col. 4, lines 40-45).

31. Claim 7: The supports of Carr et al. ('373) are discussed above with respect to claim 1. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 25%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 25%.

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32. Claim 8: The supports of Carr et al. ('373) are discussed above with respect to claim 7. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 15%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 15%.

33. Claim 9: The supports of Carr et al. ('373), discussed above with respect to claim 1, comprise zirconia (see col. 13).

34. Claim 10: In the supports of Carr et al. ('373), discussed above with respect to claim 1, the polymer network comprises a soluble organic polymer crosslinked in place with the mineral oxide matrix (see col. 27, lines 1-50).

35. Claims 11-12: Girot et al. ('732) further teaches polysaccharides including cellulose derivatives (col. 17, lines 2-3). It is considered that it would have been obvious to one of ordinary skill in the art to have utilized a polysaccharide, and specifically a cellulose derivative, as the polymer of Carr et al. ('373), because Girot et al. ('732) also uses the polymers to coat inorganic matrices (col. 5), and Carr et al. ('373) discloses the use of many alternative polymers (col. 8, lines 59-68).

36. Claim 13: In the supports of Carr et al. ('373), discussed above with respect to claim 10, the polymer is disclosed to be polyvinyl alcohol (col. 8, lines 60-68).

37. Claim 14: In the supports of Carr et al. ('373), discussed above with respect to claim 1, the polymer network comprises monomers copolymerized in place with the mineral oxide matrix (col. 8, lines 59-68).

38. Claims 15-22: The monomers of Carr et al. ('373), discussed above with respect to claim 14 include vinylpyrrolidone (col. 65). (Note: the monomer being vinylpyrrolidone is within the claim boundary of each of claims 15-22).

39. Claim 59: The supports of Carr et al. ('373), discussed above with respect to claim 2, are in the 5-500 micron range (col. 4, lines 40-45).

40. Claim 6: Carr et al. ('373) discloses dense mineral oxide solid supports comprising a mineral oxide matrix and an interactive polymer network which is rooted in pores and on the surface of the mineral oxide matrix (see abstract). The supports are in the 10-100 micron range (col. 4, lines 40-45). The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity <30%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity below 30%. Carr et al. ('373) fails to explicitly disclose a density of 2.1-11, however because the supports of Carr et al. ('373) are zirconium oxide (see col. 13), it is considered that the density would intrinsically be in this range if the porosity is less than <30%, because zero porosity zirconium oxide has a density of 5.9.

41. Claim 60: The supports of Carr et al. ('373) are discussed above with respect to claim 6. The lowest porosity explicitly disclosed is 31%, which occurs at a sintering temperature of 900 degrees. It is considered that it would have been obvious to one of ordinary skill in the art to have made the porosity between 5 and 25%. Carr et al. ('373) discloses the "the surface area and pore volume decrease with increasing firing temperature" (col. 13, lines 37-39) and also that the sintering temperature can range from 100-1500 degrees (col. 8, lines 20-29). This would suggest to one of ordinary skill in the art to decrease the porosity between 5 and 25%.

42. Claim 61: The supports of Carr et al. ('373), discussed above with respect to claim 6, comprise zirconia (see col. 13).

43. Claim 62: In the supports of Carr et al. ('373), discussed above with respect to claim 6, the polymer network comprises a soluble organic polymer crosslinked in place with the mineral oxide matrix (see col. 27, lines 1-50).

44. Claim 63: In the supports of Carr et al. ('373), discussed above with respect to claim 6, the polymer network comprises monomers copolymerized in place with the mineral oxide matrix (col. 8, lines 59-68).

### ***Response to Arguments***

45. Applicant argues that Carr ('373) fails to disclose or suggest a porosity below 31%. In lines 20-25 of col. 8, Carr ('373) states that the firing temperature range of the invention is 100-1500 degrees, more preferably 400-1100 degrees. It is clear from the data of table I and the recognized trend of the data (see col. 13, lines 35-42) that the upper endpoints of each of these ranges would result in a porosity of less than 30 %.

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Applicant argues that Carr ('373) teaches maximizing porosity and teaches away from low porosity; however, because 100-1500 degrees is the disclosed temperature range, porosity value resulting from temperatures within this range are within the scope of the invention.

46. Applicant argues that the network of Carr et al. ('373) is not rooted in pores. It is unclear whether this is the case because the meaning of "rooted in pores" is not clear. Applicant points out that according to the instant specification "the pore volume is left just large enough to allow polymers to be rooted ...". The applicant also states that Carr ('373) suggests that pore volume and size should be maximized. Therefore, if pore volume determines whether a network is rooted, the network of Carr ('373) would also be rooted.

### ***Conclusion***

47. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to David L. Sorkin whose telephone number is 703-308-1121. The examiner can normally be reached on 7:30 - 5:00 Mon.-Thur., Alternate Fridays.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wanda L. Walker can be reached on 703-308-0457. The fax phone numbers for the organization where this application or proceeding is assigned are 703-305-7718 for regular communications and 703-305-3599 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0661.



David Sorkin

May 15, 2001

  
JOHN KIM  
PRIMARY EXAMINER  
GROUP 1800